

Borehole

51-02-02

Log Event A

Borehole Information

| | | |
|-------------------------|---------------------------------|----------------------------------|
| Farm : <u>TX</u> | Tank : <u>TX-102</u> | Site Number : <u>299-W15-170</u> |
| N-Coord : <u>41,688</u> | W-Coord : <u>75,820</u> | TOC Elevation : <u>671.93</u> |
| Water Level, ft : | Date Drilled : <u>4/30/1974</u> | |

Casing Record

| | | |
|----------------------------|--------------------------------|--------------------|
| Type : <u>Steel-welded</u> | Thickness : <u>0.280</u> | ID, in. : <u>6</u> |
| Top Depth, ft. : <u>0</u> | Bottom Depth, ft. : <u>100</u> | |

Borehole Notes:

This borehole was drilled in April 1974 and completed to a depth of 100 ft. The drilling log does not mention casing perforations or grout. The top of the borehole casing is even with the ground surface. The casing thickness is presumed to be 0.280 in., on the basis of published thickness for schedule-40, 6-in. steel tubing.

Equipment Information

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|-----------------------------------|---|--|
| Logging System : <u>1</u> | Detector Type : <u>HPGe</u> | Detector Efficiency: <u>35.0 %</u> |
| Calibration Date : <u>10/1995</u> | Calibration Reference : <u>GJPO-HAN-3</u> | Logging Procedure : <u>P-GJPO-1783</u> |

Log Run Information

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|---------------------------------|---------------------------------|------------------------------------|
| Log Run Number : <u>1</u> | Log Run Date : <u>1/11/1996</u> | Logging Engineer: <u>Bob Spatz</u> |
| Start Depth, ft.: <u>0.0</u> | Counting Time, sec.: <u>100</u> | L/R : <u>L</u> Shield : <u>N</u> |
| Finish Depth, ft. : <u>30.0</u> | MSA Interval, ft. : <u>0.5</u> | Log Speed, ft/min.: <u>n/a</u> |

| | | |
|---------------------------------|---------------------------------|------------------------------------|
| Log Run Number : <u>2</u> | Log Run Date : <u>1/12/1996</u> | Logging Engineer: <u>Bob Spatz</u> |
| Start Depth, ft.: <u>98.0</u> | Counting Time, sec.: <u>100</u> | L/R : <u>L</u> Shield : <u>N</u> |
| Finish Depth, ft. : <u>29.0</u> | MSA Interval, ft. : <u>0.5</u> | Log Speed, ft/min.: <u>n/a</u> |



Spectral Gamma-Ray Borehole
Log Data Report

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Borehole

51-02-02

Log Event A

Analysis Information

Analyst : E.P. Baumgartner

Data Processing Reference : P-GJPO-1787

Analysis Date : 9/9/1996

Analysis Notes :

The logging of borehole 51-02-02 was completed in two runs using the SGLS. The field verification spectra recorded immediately before and after the survey operation met the acceptance criteria established for the peak shape and system efficiency, confirming the SGLS system was operating within specifications. The energy calibration and peak-shape calibration from these verification spectra were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

A depth overlap, where data were collected by separate logging runs over the same depth interval, occurred in this borehole between depths of 29 and 30 ft. The concentrations of the natural radionuclides K-40, U-238, and Th-232 were calculated using both the original and repeated log data sets at the overlapping points. The calculated concentrations using the two separate data sets were within the statistical uncertainty of the measurements, indicating very good repeatability of the radionuclide concentration measurements.

Casing-correction factors for a 0.280-in.-thick steel casing were applied during analysis.

Cs-137 was the only man-made radionuclide detected in this borehole. Cs-137 was detected continuously from the surface to 22 ft, at 24.5 ft, and at one measuring point at the bottom of the borehole. Peaks in the concentration occur within this zone at the surface and in the interval between depths of 11.5 and 12.5 ft; measured Cs-137 concentrations are about 3 pCi/g at these two locations. Below 13.5 ft all the values are less than 1 pCi/g. Cs-137 was not detected between 24.5 and 98 ft in this borehole.

The K-40 concentration log has a sharp increase at 49.5 ft from a mean of about 12 pCi/g to a mean of 19 pCi/g. The U-238 and Th-232 log plots also have a slight increase in mean value at this depth.

The SGLS total count log plot has a zone of high counts between 11.5 and 12.5 ft that exactly mimics the shape of the plot of Cs-137 concentrations. There is a significant sharp drop in the count rate at 90 ft that is also weakly expressed in the Th-232 log plot.

Details regarding the interpretation of the data for this borehole are presented in the Tank Summary Data Report for tank TX-102.

Log Plot Notes:

Separate log plots show the man-made (e.g., Cs-137) and the naturally occurring radionuclides (e.g., K-40, U-238, and Th-232). The natural radionuclides can be used for lithologic interpretations. The headings of these plots identify the energy peak for the specific gamma rays used to calculate the concentrations. Uncertainty bars on the plots show the statistical uncertainty for the calculated concentrations at the 95-percent confidence level. The MDL is shown by open circles on the plots. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.

A combination plot includes the man-made radionuclides, the naturally occurring radionuclides, the total gamma count derived from the SGLS and the WHC Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data from WHC with no attempt to adjust the depths to coincide with the SGLS data.